CS110FV
In-Field Verifier
for the CS110 Electric Field Meter

1. Open the Verifier case. Unplug the power connector, remove the alkaline battery pack, and install the 8 alkaline D cell batteries. Then, reinstall the battery pack and power connector.

2. Remove the test cover and its cable from the case. Install the test cover over the CS110 stator, making sure the holes align with the two screws on the stator. Hold the other end of the test cover so the stop on the cover maintains contact with the rim of the stator. Tighten the thumb screws to hold it in place.

3. To ground the unit, loosen one of the six screws that secure the CS110 lid. Slide the ground lug under the screw head and tighten. Connect the Verifier cable’s plastic connector to the CS110 RS-232 port. Connect the cable’s metal connector to the connector in the top right corner of the Verifier.

To set up the Verifier, you will need the following information:

- Serial number (from 1001 to 5001) – This is found on the sticker on the CS110 and the CS110 calibration certificate.
- Original MPARALLEL PLATE (from 79.99 to 100) – This is found on the sticker on the CS110 and the CS110 calibration certificate.
- Csite (from 0.01 to 10.01, default = 0.1) – This is found in the CS110 program Constant Table.
- PakBus Address (from 1 to 3998, default = 1) – This is found in the CS110 settings.
- RS-232 baud rate (default = 115200, SG000 option = 2400)
- Electric field variable name (default = EFM_Efield_v_m or EFM_Efield) – This is the name of the Public Table variable that holds the one-second electric field value in the CS110.

1. Turn on the CS110 and make sure it is shuttering every second. If it is not shuttering every second, you can load the default shipping program, named “CS110 Shipping Program 20080515.CR1”, or any other program with that effect.
2. Use the switch to turn on the Verifier.
3. On the Verifier display, select Enter Setup Values. Press Enter, and enter the following setup values and settings:
• Serial number (CS110 SN)
• Original MPARALLEL PLATE (CS110 MMP)
• Csite value (CS110 Csite)
• PakBus Address (PakBus Addr)
• RS-232 Baud Rate
• Electric field variable name (Efield Var)
• Enable or disable the Verifier GPS sensor (GPS T=-1, F=0). The default is False.
  • If the GPS is enabled, enter the UTC offset in hours (UTC OffsetHr), from –12 to +12.
  • Security code of the CS110, if any (Security). The default is 0.

Then, set ApplyChanges to TRUE to apply changes.

If the Test Ready LED does not turn on, go to Efield GPS Battery in the main menu and check the following:
• If the Verifier is getting the one-second electric field data from the CS110, a small electric field reading will be displayed when the test cover is on. A –99999 could indicate an incorrect PakBus address, baud rate, or electric field variable name, or it could indicate a cable or connector issue.
• If the GPS is enabled and a satellite is found, the latitude, longitude and number of satellites will be displayed. If the GPS hasn't locked on to a satellite, the GPS will display –99999. It can take 3-4 minutes for the GPS to lock on to a satellite.
• If the Verifier battery is low (< 9.6 Vdc), it will display -99999 or the unit will not power up (no/bad display screens). Replace the batteries.

Press ESC to exit to the main menu.

Running the Verification Process

1. Select Start Verify or Abort, and then set Start_Verify to TRUE to start the verification process. The Test In Progress LED will turn on and remain on until the process is complete. Press ESC to exit to the main menu.
2. Select View Verify Progress to watch the verification progress. You will see each step as it is completed, including the following:
  • Voltage applied by the charge plate
  • Voltage measured by the CS110
  • Security code of the CS110, if any (Security). The default is 0.
3. When the verification process finishes, the Test In Progress LED will turn off and the Test Ready LED will turn on.
4. Press ESC to exit to the main menu.

Press Esc to exit to the main menu. The verification results are stored in the Verifier memory data table named Fit. You can retrieve these results from the Verifier using Campbell Scientific’s Device Configuration Utility or LoggerNet software, available at www.campbellsci.com.

Turn the Verifier off after use.

Using the Keyboard

The 16 keys default to , , ▲, ▼, or to the function printed directly on each key. To enter numbers, first press Num Lock. Num Lock stays set until pressed again. Above all keys, except Num Lock and Shift, are characters printed in blue. To enter one of these characters, press Shift one to three times to select the position of the character as shown above the key, then press the key. For example, to enter Y, press Shift Shift Shift PgDn.
To insert a space (Spc), press Shift once, then press BkSpc.
To change to lower or upper case (Cap), press Shift twice rapidly, then press BkSpc. To insert a character not printed on the keyboard, enter Ins, scroll down to Character, press Enter, then press , , , to scroll to the desired character in the list that is presented, then press Enter.

After the verification process is complete, select View Verify Results. The following values are given:
• CS110 serial number (CS110 SN)
• CS110 original MPARALLEL PLATE (CS110origMPP)
• Verified MPARALLEL PLATE (Verified MPP)
• MPARALLEL PLATE percent change (MPP % Change) (should be <5%)
• Verify R2 (should be very close to 1.0)
• Verify Offset (Verify Offset)
• Verify Zero – This is the CS110 electric field measurement when the charge plate voltage is zero. A clean CS110 should have a Verify Zero value of < 6 V/m when the CS110 Csite factor is set to 0.1 (default).

Press Esc to exit to the main menu.